Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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SIGNAL ANALYZERS

Dual-Channel, Dynamic Signal Analyzer 64 μHz to 100 kHz

HP 3562A

- Network, spectrum, waveform, transient analysis
- Linear, logarithmic, swept sine modes
- 80 dB dynamic range with full alias protection
- High accuracy (±0.15 dB)

DESIGNED FOR HP-IB SYSTEMS

HP 3562A

The HP 3562A is essentially a dual-channel spectrum analyzer that provides resolution to 25.6 μHz anywhere within the 64 μHz-to-100 kHz measurement range. Amplitude accuracy is ±0.15 dB with 80 dB of dynamic range. Modulation analysis can be performed on either or both channels with harmonic and sideband markers as well as with the built-in demodulation capability: zoom measurements can be AM, FM, or PM demodulated with carrier frequencies up to 99.9 kHz.

HP 3562A Dynamic Signal Analyzer

The HP 3562A dynamic signal analyzer is well suited for design, test, and analysis of electronics, mechanical systems, and electro-mechanical control systems. Two input channels, 64 μHz-to-100 kHz frequency range, 150 dB measurement range, and 80 dB dynamic range in this FFT-based analyzer, offer versatility and performance for even the most difficult spectrum, and waveform measurements, in both time and frequency domains.

The two high-performance input channels and a built-in signal source (noise and sine signals) address network analysis needs on the bench or in a test system. Vector averaging, waveform math, 40-pole/40-zero curve fitter, and frequency response synthesis enhance network measurements with a full range of analysis and modeling capabilities. Zoom analysis, with frequency resolution to 25.6 μHz, plus a powerful AM, FM, and PM demodulation function, make the HP 3562A a versatile spectrum analyzer. For transient or waveform analysis, signals can be sampled, digitized, and then stored in internal memory, or sent via HP-IB to an external disk drive (without a computer). Stored waveforms can be recalled and analyzed in the time, frequency, and amplitude domains (baseband and zoom analysis).

Frequency Response Measurements

You can make accurate, high-resolution frequency response measurements of electronic and mechanical systems with linear or logarithmic resolution FFT and swept sine analysis. A built-in signal source provides a variety of random noise and sine wave signals to meet the requirements of the system under test.

Linear resolution is the measurement technique common to all dynamic signal analyzers. In the HP 3562A, 2048-point time records are Fourier-transformed into 801-line frequency spectra. For network analysis, frequency response magnitude and phase, as well as input and output power spectra, can be measured with 801 lines of resolution. Accuracy for the frequency response magnitude and phase is ±0.1 dB and ±0.5°.

The swept-sine mode configures the HP 3562A as a powerful swept-sine frequency response analyzer. The source can generate linear or logarithmic sweeps with increasing or decreasing frequency: user-selectable sweep rate and resolution are also standard source functions. Input channel functions include user-selectable averaging and integration time; automatic input ranging can be activated to provide over 140 dB of dynamic range for measurements of high performance systems.

Spectrum Analysis

On-line analysis of distortion, drift, modulation, and phase noise can benefit from the speed and accuracy of the HP 3562A. High-resolution measurements are typically 100 times faster than tuned spectrum analyzers. Because the HP 3562A is an FFT-based analyzer, you can see transient events a tuned analyzer would probably miss.

Waveform and Transient Analysis

Perform complete analysis of waveforms and transients in the time and frequency domains. Store sampled and digitized waveforms in internal memory (single-channel time capture) or on disk in an external disk drive (single- or dual-channel time throughput). Recall data for time domain analysis as single time records or as a compressed display of up to 10 time records (time capture mode). Data can also be recalled for baseband and zoom analysis in the frequency domain with vector averaging, if needed.

The array of triggering capabilities enhances both waveform recording modes. Pre- and post-trigger delays can be specified to capture the rising edge of a transient or to compensate for delays in the system under test.

Hardcopy and Mass Storage

When access to prototypes is limited, make your test time more efficient with the time throughput capability; through direct control of external disk drives, the HP 3562A stores time data directly to disk without a computer.

HP-IB is a standard feature to speed and simplify documentation of results with direct control of plotters and disk drives. Anything displayed on the analyzer screen can be plotted or saved on disk, including measurement results, setup state tables, synthesis tables, curve fit tables, and auto-sequence or auto-math program listing.

Automation for Improved Productivity

As a standalone solution, the analyzer can "learn" a series of keystrokes and then perform them on command (auto-sequence programming). Up to five auto-sequence programs can be stored internally, with additional programs stored on an external disk drive. For networked HP-IB systems, the HP 3562A provides complete HP-IB programmability. Custom display graphics messages can be created with direct programming of the display, and user-defined softkey menus can be created to simplify interactive testing.

Specifications (HP 3562A, 3563A)

Contact your local HP sales office for more information, including a data sheet with complete specifications.

Frequency

Measurement range: 64 μHz to 100 kHz. Both channels, single- or dual-channel operation.

Resolution: Span/800. Both channels, single- or dual-channel operation, linear resolution mode.

Spans	Baseband	Zoom
# of spans	66	64
min. span	10.24 mHz	20.48 mHz
max. span	100 kHz	100 kHz
time record (sec)	800/span	800/span

Window functions: Flat top, Hann, uniform, force, exponential, user-defined

Typical real-time bandwidths:

Single-channel, fast averaging 10 kHz

Throughput to CS/80 disk

Single-channel	12.5 kHz
Dual-channel	6.25 kHz

Amplitude

Accuracy: Defined as full-scale accuracy at any of the calculated frequency points. Overall accuracy for the linear or logarithmic resolution modes is the sum of the absolute accuracy, window flatness, and noise level. Overall accuracy for swept-sine mode is the sum of absolute accuracy and noise level.

Absolute accuracy: Single channel (channel 1 or 2)
±0.15 dB ±0.015% of input range (+27 dBV to −40 dBV)
±0.25 dB ±0.025% of input range (−41 dBV to −51 dBV)
Window flatness:
Flat top +0, −0.01 dB
Hann +0, −1.5 dB
Noise floor: With flat top window, 50Ω source impedance and input set to −51 dBV range
20 Hz to 1 kHz (1 kHz span) < −126 dBV (−134 dBV$\sqrt{Hz}$)
1 kHz to 100 kHz (100 kHz span) < −115 dBV (−144 dBV$\sqrt{Hz}$)
Frequency response channel match:
Analog/analog: Input signals at full scale on any pair of ranges, Accuracy is ±0.1 dB, ±0.5 degree (HP 3562A and HP 3563A).
Digital/digital: For simultaneous sampling on channels 1 and 2, accuracy is ±0.1 dB, ±0.5 degree. (HP 3563A only).
Mixed analog/digital: With full-scale inputs on both channels, computational delay between channels corrected for; 1:1 sampling ratio, 16 averages and 256 kHz sample clock; nominal accuracy is ±0.2 dB, ±1.0 degrees from 64 μHz to 20 kHz and ±0.2 dB, ±4.0 degrees from 20 kHz to 100 kHz (HP 3563A only).
Dynamic range: All distortion (intermodulation and harmonic), spurious, and alias products are ≥ 80 dB below full scale input range (16 averages).

Analog Input (HP 3563A and 3562A)

Input impedance: 1MΩ ±5% shunted by < 100 pF
Input coupling: Inputs can be ac or dc coupled — ac rolloff is <3 dB at 1 Hz
Crosstalk: −140 dB (50Ω source, 50Ω input termination, input connectors shielded)
Common mode rejection:
0 Hz to 66 Hz 80 dB
66 Hz to 500 Hz 65 dB
External sampling input: TTL compatible input for signals ≤ 256 kHz (nominal maximum sampling rate)

Digital Input (HP 3563A)

Measurement data signals can be up to 16 bits wide and must be parallel data in two's complement or offset-binary format. (User selects truncation of unused upper bits or rounding of the three lowest bits for data more than 13 bits wide.) The data qualifier input accepts 8 qualifier lines, a trigger, and 1 clock signal.

Trigger

Trigger modes: Free run, input channel 1, input channel 2, source and external trigger. Free run applies to all measurement modes. Input channel 1, input channel 2, source and external trigger apply to the linear resolution, time capture, and time throughput measurement modes.
Trigger delay: Pre- and post-trigger delay resolution is 1 sample (1/2048 of a time record).
Pre-trigger: A measurement can be based on data that starts from 1 to 4096 samples (1/2048 to 2 time records) before trigger conditions are met.
Post-trigger: A measurement is initiated from 1 to 65,536 samples (1/2048 to 32 time records) after the trigger conditions are met.

Analog Source (HP 3563A and 3562A)

Random noise, burst random, sine chirp, burst chirp, fixed sine, and swept sine are available from the front panel source of the HP 3562A and HP 3563A. The HP 3563A also provides step, pulse, ramp and arbitrary signals from the same front panel source output. Users can select dc offset.
Output impedance: 50 Ω (nominal)
Output level: Between +10 and −10 Vpeak (ac + dc) into a ≥ 10 kΩ, < 1000 pF load. Maximum current is 20 mA.
ac level: ±5 Vpeak (≥ 10kΩ, < 1000 pF load)
dc offset: ±10 Vpeak in 100 mV steps. Residual offset at 0V offset ≤ 10 mV
Distortion: Including subharmonics
25.6 μHz to 10 kHz −55 dB
10 kHz to 100 kHz −40 dB
Pulse: Nominally 1 sample wide and bandlimited (HP 3563A)
Digital source (HP 3563A)
All analog signal types can be output from the digital source connector. Data format is 16-bit parallel in either two's complement or offset binary. Output level is TTL compatible.
Maximum load: 8 LSTTL
Maximum output rate: 256 kHz

General

Specifications apply when AUTO CAL is enabled or within 5°C and 2 hours of last internal calibration
Ambient temperature: 0 to 55° C
Relative humidity: ≤ 95% at 40° C
Altitude: ≤ 4570 m (15,000 ft)
Storage:
Temperature: −40 to +75° C
Altitude: ≤ 15240 m (50,000 ft)
Power: 86 to 127 VAC, 48 to 66 Hz
196 to 253 VAC, 48 to 66 Hz
450 VA maximum
Weight: Net, 27 kg (58 lb); shipping, 36 kg (79 lb)
Size: 222 mm H × 426 mm W × 578 mm D (8.75 in × 16.75 in × 22.75 in)

Accessories Included

HP 3563A: HP 01650-61607 16-bit probe cable: 3 each
HP 03563-61605 16-bit probe pod: 3 each
HP 03563-61604 8-bit probe cable: 3 each
HP 10347A pattern generator probe lead set: 3 each
HP 5959-0288 grabber (package of 20): 80 each (4 packages)
Pouch for cables and probes
HP 3563A/HP 3562A: Getting started guide, operating manual, programming reference

Accessories Available

HP 3563A: HP 10346A 8-Channel TTL tristate buffer pod
HP 10348A 8-Channel CMOS tristate buffer pod
HP 01650-63203 termination adapter
HP 3563A/HP 3562A: Transit case for one HP 3563A:
HP p/n 9211-2663

Ordering Information

HP 3563A Control Systems Analyzer
Opt 907 Front Handle kit
Opt 908 Rack Mount kit
Opt 909 Rack Mount and Front Handle kit
Opt 910 Extra Getting Started, Operating, Programming manuals
Option 915 Add Service manual and kit
Opt 921 PC File Utilities
Opt 922 Delete cables, pods, and pouch
Opt W30 Extended Repair Service. See page 681.
HP 3562A Dynamic Signal Analyzer
Opt 907 Front Handle kit
Opt 908 Rack Mount kit
Opt 909 Rack Mount add Front Handle kit
Opt 910 Extra Operating manuals
Opt 914 Delete Service manuals
Opt W30 Extended Repair Service. See page 671.

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